Washington State Department of Labor and Industries

ELECTRICAL CURRENTS

Newsletter from the Office of the Chief Electrical Inspector

Ron Fuller, Chief Electrical Inspector **Vol. 9 No. 3** **March 2006**

● LAST CHANCE! "Grandfathering" Experience For Appliance Repair (07D) Certification—Application Deadline Is June 30, 2006

The final opportunity ends on June 30, 2006 for appliance repair experience (obtained without possessing a training certificate or working under the supervision of a certified 07D appliance repair specialty electrician) to be "grandfathered" to qualify for the 07D appliance repair specialty electrician certification examination.

Applications are available on the "Forms and Publications" page of our Web site and accepted if the individual submits all of the following:

- An OPEN WINDOW OPPORTUNITY APPLICATION FOR APPLIANCE REPAIR SPECIALTY ELECTRICIAN TEMPORARY PERMIT AND EXAMINATION (Valid as allowed and described in WAC 296-46B-940(28)). The fee is $99.00. ($23.90 is nonrefundable after the application for the original specialty electrician certificate is submitted.) ($52.70 is nonrefundable after the temporary permit is issued.) A separate $50.00 fee for the examination is paid directly to the exam contractor when scheduling the examination.
- A notarized verification letter from the individual's employer(s) documenting:
  - The work was in the appliance repair specialty scope of work [as described in WAC 296-46B-920(2)(k)]. The employer must have been in the business of appliance repair work during the entire verification period and must establish legal business status during this time with copies of their business license or RCW 18.27 contractor registration. Sole proprietors with one year (2,000 hours) of the above business documentation and experience may verify their own experience;
  - The specific date time period for which credit is being sought; and
  - The number of previous work experience hours for which credit is being sought. (Coincidental experience previously claimed in another specialty for the same time period, will not be allowed.)

Individuals credited with the minimum 2,000 hours of previous work experience will be eligible for a temporary specialty electrician permit for the purposes of working without supervision and for supervising trainees in the appliance repair specialty. **The temporary permit will be valid for a period of 12 months** or until the individual has passed the appliance repair examination, whichever comes first. If the individual does not successfully complete the exam in the 12-month period, they must obtain a training certificate and work under supervision to continue performing appliance repair.

● Electrician, Master Electrician, and Administrator Exams Will Be Revised

April 10, 2006 is the implementation date for electrical exams based on the 2005 NEC. From a candidate's standpoint, this should not affect your exam preparations. All exam questions are based on basic safety, Code, and theory fundamentals. These rarely change with a new NEC edition. Most changes in the exam are reference updates. Very few questions have been changed because of a Code update.

On April 10th, the journeyman and specialty electrician exams will be divided into separate sections, similar to the master electrician and administrator exams. WAC and RCW questions will be in one section, Code and theory will be in another section. Total time allowed for the complete exams (both sections) will remain the same as it is now for the single-part exam. Both sections must be taken on your original examination. If you pass one section and fail the other, you will be allowed to reschedule the failed section. You will have 12 months from your initial exam date to complete both sections, or you will be required to re-take both parts and begin a new 12-month cycle. For all exams the total exam questions will remain similar to the current number asked.

Separating the state laws and rules material from the basic Code and theory material will allow an unsuccessful exam candidate to focus their studies on the specific areas where they are weak. This new structure will also make it easier for the department to pursue further sharing of examinations with the other states involved in our reciprocal electrical licensing agreements.

● Requirements For Contractor Installing Service Laterals/Drops For Developers Or Utilities

In the April 2004 Electrical Currents, we printed an article under this same title. We stated, *"RCW 19.28.091(1) provides for exemption from the permitting, inspection, licensing, and certification requirements for service lateral installations only if the entity doing the work is employed by the electrical utility. The firm/contractor and utility must have a contract in place (not implied) prior to performing the installation of the underground conduit or conductors."* Recent questions from inspectors and contractors shows a need for clarification of that article.

The contract referred to in the previous article is not necessarily a typical business contract. To be exempt from the licensing, certification and permitting laws, the utility must either own or control the installation while it is being made and operated. The utility may establish ownership and/or control in several ways.

A typical utility to subcontractor relationship may be established using a formal contract. Control may be established with a written agreement. Control may be established by the formalized design and installation requirements published by the utility (e.g. design & installation requirements and required inspection oversight). If the agreement between the utility and developer meets any of these requirements and is in place prior to beginning the work, the developer and/or the developer's sub-contractor may install the lateral without having an electrical contractor's license, certified electricians, or electrical permit. In this case, the developer is acting as the utility's subcontractor as allowed in RCW 19.28.010(1) and 19.28.091(1) as long as the work is ahead of the utility's service point and the work is restricted to utility distribution and transmission work described in NEC 90.2(b)(5) – 1981 version.

If the developer does not have such a contract or agreement with the utility there is no exemption; the entity making the installation must: be a licensed electrical contractor, use certified electricians, and obtain a permit and inspection. It is the responsibility of each installer to determine if they are working in an exempt situation.

Even if the lateral is exempt, the riser portion of all underground conduit runs attached to any structure must either be installed by the owner (as allowed in the owner exemption) or a licensed electrical contractor using certified electricians. The riser also requires permitting and inspection.

● GFCI and AFCI Requirements In Studio Apartments

The requirements for GFCI protection for personnel are found in NEC 210.8. Studio apartment receptacles must comply with 210.8(A). There are no exceptions to the bathroom GFCI requirement. For example, if a washing machine is located in the bathroom, the 15-amp or 20 amp 125 volt receptacle that is required to be supplied from the laundry branch circuit must be GFCI protected. GFCI protection is also required in kitchens where receptacles are installed to serve the countertop surfaces. Receptacles that are within six feet of the outside edge of any sink shall be protected also.

NEC 210.12(B) says: "*All 120-volt, single phase, 15-and 20-ampere branch circuits supplying outlets installed in dwelling unit bedrooms shall be protected by a listed arc-fault circuit interrupter, combination type installed to provide protection of the branch circuit."* The dictionary defines "bedroom" as "a room intended for sleeping." In a studio apartment, the living area and sleeping area is one room and NEC 210.12(B) must be followed. All outlet (see NEC 100 for definition) circuits in the shared living/bedroom must be protected by an AFCI. If any other area shares the studio's bedroom area (e.g. kitchen, dining area, etc.), then all outlet circuits in the shared area must also be AFCI protected.

There is no prohibition against using AFCI protection on other circuits or in locations other than bedrooms.

● Plan Review Requirements For School Work

Specific requirements should be addressed when deciding to undertake the project of performing electrical installations on schools. WAC 296-46B-010 (14)(a) states that an "***Educational facility*** *refers to a building or portion of a building used primarily for educational purposes by six or more persons at one time for twelve hours per week or four hours in any one day. Educational occupancy includes: Schools (preschool through grade twelve), colleges, academies, universities, and trade schools".*

You must refer to WAC 296-46B-010(16) to determine if formal plan review is required for electrical work done in an educational occupancy. Some projects that would **not require** plan review are: low voltage

systems; energy conservation lighting projects that result in an electrical load reduction on each feeder involved; or a stand-alone utility-fed service not exceeding 250 volts and 400 amps that does not include an emergency system (other than battery back-up unit equipment) or a required fire pump system.

When review is required, the electrical plan should be submitted for review and approval before any electrical work is begun. The electrical plan must be submitted for plan review prior to requesting any electrical inspection. If a plan is rejected during the plan review process, no electrical inspection(s) may proceed until the plan is resubmitted and a conditional acceptance is granted. Once the submitted plan has been approved, the approved plan set must be available on the job site for use by the electrical inspector. If the approved plan requires changes from the conditionally accepted plan, alterations to the project may be required to make the project comply with the approved plan. If changes occur to the project during its construction so it no longer complies with the approved plans, the electrical modifications must be resubmitted to plan review for approval.

All electrical plans for educational facilities must be prepared by, or under the direction of, a consulting engineer registered under chapter 18.43 RCW, and chapters 246-320, 180-29, and 388-97 WAC and stamped with the engineer's mark and signature.

Plans to be reviewed by the department must be legible, identify the name and classification of the facility, clearly indicate the scope and nature of the installation and the person, or firm responsible for the electrical plans. The plans must clearly show the electrical installation or alteration in floor plan view, include switchboard and/or panelboard schedules and when a service or feeder is to be installed or altered, must include a riser diagram, load calculation, fault current calculation and interrupting rating of equipment. Where existing electrical systems are to supply additional loads, the plans must include documentation that proves adequate capacity and ratings. The plans must be submitted with a plan review submittal form available from the department. Plan review fees are not required to be paid until the review is completed. Plans will not be returned until all fees are paid.

● Requirements For The Independent Power Producer Exemption

An Independent Power Producer (IPP) generates power that is purchased by an electric utility at wholesale prices. The utility then resells this power to end-use customers. Although IPPs generate power, they are generally not franchised utilities or government agencies. IPPs usually do not own transmission lines to transmit the power that they generate. Electrical utilities are beginning new programs to purchase electrical power from independent power producers (IPP). Two popular alternate sources of electricity are solar photovoltaic systems and wind generation.

Some of the requirements for an IPP to be exempt from having an electrical contractor's license to work on electrical equipment are:

- The electrical power generated by the facility is not used for self generation or any other on- or off-site function other than sale to one or more utilities.
- The entity has entered into an agreement to sell electricity to a utility or to a third party and the electrical equipment is used to transmit electricity from the terminals of an electrical generating unit located on premises to the point of interconnection with a utility system.
- The electrical equipment is used to transmit electricity to a utility or to a third party;
- The electrical power production facility exceeds 115 KVA.

RCW 19.28.091(2)(c) and WAC 296-46B-925(18) allow independent power producers exemption when they meet specific criteria. Each IPP must make application to the Chief Electrical Inspector, prior to beginning the project, to be recognized as an IPP exempted from the requirements of the RCW 19.28 and WAC 296-46B. Failure to do so may result in non-compliance citations and civil penalties. Installation of alternate power sources constructed for standby or supplemental onsite use by a utility customer must comply with all requirements set forth in RCW 19.28 and WAC 296-46B for permitting, inspections, licensing, and worker certification.

● Requirements For PVC Expansion Joints

Like all construction materials, rigid nonmetallic conduit will expand or contract with variations in temperatures. Per degree change in temperature, rigid non-metallic conduit exhibits a considerably greater change in length than metal conduit systems. NEC 352.44 requires that expansion fittings *"shall be provided to compensate for thermal expansion and contraction where the length change, in*

accordance with Table 352.44(A) or Table 352.44(B), is expected to be greater than 6mm (¼ in.) or greater in a straight run installed between securely mounted items such as boxes, cabinets, elbows, or other conduit terminations." Conduit manufacturers may also require that up to 30 degrees temperature change be added when the installation is made in an area exposed to direct sunlight.

Example: A 10-foot straight length of conduit is installed between two junction boxes; the geographical area reaches a low temperature of 20ºF in the Winter and a high of 90ºF in the Summer; the conduit run is on the south side of the building and exposed to direct sunlight. The proper calculation is as follows:

Summer high (90ºF) minus winter low (20ºF) is a difference of 70 degrees. Since the conduit is exposed to direct sunlight, add an additional 30 degrees for radiant heating effects. The result is a 100 degree total temperature differential. Table 352.44(A) indicates a 100-foot run of conduit will change 4.06 in. The 10-foot length is 10% of the 100-ft. length found in the table. Therefore it will change 10% of 4.06 in. or 0.406 in. Since this length change is greater than 0.25 in. an expansion fitting is required.

Most manufacturers maximum travel range of rigid nonmetallic conduit expansion fittings is 4 to 8 inches, depending on conduit diameter. At the time of installation consideration must be given to the current ambient temperature (to ensure adequate contraction as well as expansion travel in the fitting) and to securing the conduit with a method that will allow it to move. You must follow the manufacturer's installation instructions.

● Correction – Penalty Amounts Incorrect

In preparing the violator list for the February 2006 Electrical Currents, L&I had a computer reporting problem. Several entities were shown having higher penalty amounts than what were issued. The following are the correct penalty amounts.

	Incorrect amount	Correct Amount
Violation – No Electrical Contractor's License		
Brandt	$1,000	$500
Indoor Air Solutions	$1,000	$500
Cozy Air	$3,000	$1,500
Violation – Hiring Uncertified Electricians		
Brandt	$500	$250
Elite Lighting and Electrical	$200	$100
Bruce Smith Heating and Cooling Inc.	$600	$300
Violation – Uncertified Electrician		
Thomas Kunaschk	$600	$300
Timothy Rowlands	$600	$300
Violation – No Electrical Work Permit		
Brandt	$500	$250
Floral Mollgaard	$500	$250
Jerry Trussell	$500	$250
Quality One Landscaping and Irrigation	$500	$250
Pyramid Electric Inc.	$1,250	$250
Merit Mechanical	$4,000	$2,000
Masterwire	$4,000	$2,000

● Electrical Question of the Month

This Month's Question: Masts that extend through the roof to support overhead service, feeder or branch circuit drops consisting of conductors not larger than 1 AWG aluminum or 3 AWG copper are required to be minimum size: **A)** 2-inch, or larger, Rigid Steel Galvanized Conduit (RMC), **B)** 2-inch Intermediate Metal Conduit (IMC), **C)** 3-inch Electrical Metallic Tubing (EMT), **D)** 1¼" Rigid Steel Galvanized Conduit (RMC)

Last Month's Question: When equipment has been recognized as suitable for a specific purpose, function, use, environment, application, and so forth, it is which of the following: **A)** Approved, **B)** Listed, **C)** Identified, **D)** Labeled. The answer is: **C)** [NEC 100 Definitions]